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Perceived ʹSkill Level of Librarians Working at Libraries of Tehran Medical Universities

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“Perceived skill level of librarians working at libraries of Tehran Medical Universities”

Abstract

Background: Improving the quality of library services is influenced by the workforce employed, which requires the use of skilled and competent personnel. Therefore, identifying necessary skills for LIS professionals and assessing their skill level is important.

Objectives: This study conducted to assess the discipline specific and general skill level of librarians working in libraries of the top three Iranian medical universities in Tehran.

Methods: The survey was carried out among all 115 librarians working in the libraries of Iran, Tehran and Shahid-Beheshti University of Medical Sciences. The data were analyzed using descriptive statistics and one-way ANOVA.

Results: The participants’ perceived skill level in discipline specific set of skills was relatively unsatisfactory in total while their skill level in general skills was relatively satisfactory. The total mean score for discipline specific and general skills was also 2.97 and 3.03.

Conclusion: Considering the unsatisfactory level of the librarians’ discipline specific skills and the significant relationship between the degree of education and the level of discipline specific and general skills, more effective planning is needed for the training of the required skills, revising the curriculum, and planning for in-service training for LIS professionals.

Keywords: Discipline specific Skills, General Skills, Librarians, Assessment

Introduction

The great advancements in information and communication technology (ICT) has created many changes in most professions. Library and information sciences (LIS), like other professions, have also been affected by these advances. (Minaeifar, Ahmadi, & Heydaripanah, 2014) One of the main implications of this revolution in ICT was that it has changed the nature of the knowledge and skills LIS professionals require at workplace. (Raju, 2014) As a result, librarians need to acquire new knowledge and skills to better perform their roles in this ever-changing environment. (Nonthacumjane, 2011)

University libraries are traditionally playing an important role in supporting teaching and learning process. (Doroudi, 2011) In particular, medical libraries are an important and integral part of the medical universities as well as the healthcare organizations' core functions in teaching, learning, research, and medical practice. That is, medical libraries need more skilled and competent librarians to meet the information needs of their target users (medical students, faculty members, and medical practitioners). (Sadri, 2002)

According to the literature, the required skills for LIS professionals are classified mainly into two strands of discipline specific and general skills. For example, Partridge and Hallam identified two set of intertwined discipline knowledge and general capabilities for librarians. (Partridge & Hallam, 2004) By conducting a content analysis on 180 LIS job advertisements in UK, Orme grouped the LIS skill requirements into three categories: professional skills, general skills and personal qualities. (Orme, 2008) Nonthacumjane also found that the key skills and competencies for LIS professionals are personal skills, general skills, and discipline-specific knowledge. (Nonthacumjane, 2011) Concluding the literature review, the two set of discipline specific and general skills were adopted in the current study.

Research highlighted the significance of employing skilled and professional staff to provide efficient services based on the ever-changing needs of library users (Fadaei-Araghi, 1996; Missingham, 2006; Mokhlesi, 2012; Sadri, 2002). That is, the constant assessment of the librarians' skill level and conducting the relevant improvement programs are important for providing high quality services. (Mohammadbeygi & Hasanzadeh, 2009) However, research conducted in Iran mostly focused on reviewing the LIS course content and the curriculum rather than assessing the current skill level of

librarians working, in particular, in medical libraries (Fattahi, 2000; Gavgani, Shokraneh, & Shiramin, 2011; Mirzaiee, 2004), which can then the results be used in updating the curriculum too.

On the other hand, the quality of services in medical libraries of Iranian universities are relatively low (Bahari-Movafagh, Hamidi, & Giti, 2015; Ghaffari & Korani, 2010; Hariri & Afnaei, 2007; Mardani & Sharifmoghadam, 2012). There is a direct relationship between the librarians' proficiencies and user satisfaction (Belline & Rizzi, 2001). Accordingly, the low quality of services and low level of user satisfaction in these libraries might be due to the librarians' low skill level. (Mokhlesi, 2012) Therefore, this study aimed to identify the necessary skills for medical librarians and to assess the perceived skill level of librarians working in top three medical universities in Tehran: Iran University of Medical Sciences, Tehran University of Medical Sciences, and Shahid-Beheshti University of Medical Sciences. Hence, by identifying the necessary skills and realizing the shortcomings, more efficient planning can be carried out to reach the desired condition.

Methodology

This study is a survey carried out in 2016 and a questionnaire was used for data collection. The questionnaire was designed based on a review of the literature, among which the questionnaires by Ullah and Anwar and also professional competencies for health sciences librarians recommended by the MLA (Medical Library Association) were used. The questionnaire items consisted of two sections including discipline specific skills and general skills. Discipline specific skills included six categories: Health sciences environment (9 items), health sciences reference and information services (11 items), management of health information resources (11 items), information systems and technologies (15 items), user education (5 items), and research methods (6 items). General skills were also evaluated with 15 items. The questionnaire was based on a Likert scale at five levels from very high (5) to very low (1). To check the validity, the questionnaire was reviewed by eight faculty members of medical library and medical information sciences and also two statisticians. The Cronbach's alpha coefficient was used to estimate the internal consistency and reliability of the questionnaire items, which

was confirmed at 0.98. The questionnaire was distributed to all 115 librarians working in libraries of Iran, Tehran, and Shahid-Beheshti Universities of Medical Sciences (including three central libraries and 27 faculty libraries). Of the 115 librarians surveyed, 107 (93%) returned the survey. The data were analyzed using SPSS software (version 21) by computing basic descriptive statistics (frequency, mean and standard deviation) and inferential statistics (ANOVA) for testing the relationship between the participants' demographic information and their perceived skill level in discipline specific and general skills.

Results

91.6 percent of the participants were female and 8.4 percent were male. Majority of the participants had a bachelor's degree (41.9 percent) and few had a PhD degree (3.8 percent). 34.3 percent had 21 years of working experience, while 6.7 percent had below five years of working experience, showing the highest and lowest years of work experience of the participants, respectively. 64.1 percent of the participants had a degree in LIS (among which 33 percent studied medical librarianship) and 35.8 percent had degrees in other fields. The majority of the participants were in the age groups ranges of 36 to 45 years (45.7 percent) and 26-35 years (21 percent). There was no participant below 25 years old. The sample information is presented in Table 1.

To answer the research questions, the perceived level of discipline specific and general skills of the librarians working at Iran, Tehran and Shahid-Beheshti Universities of Medical Sciences was evaluated. Based on the literature review, the discipline specific skills were evaluated in six categories, each including a set of skills. These six categories were: health sciences environment, health sciences reference and information services, management of health information resources, information systems and technologies, user education and research methods.

As shown in Table 2, the results showed that the participants perceived skill level in the "health sciences environment" category was relatively low (M=2.55, out of 5) and unsatisfactory. Among all skills related to the "health sciences environment" category, "understanding of medical terminologies and concepts" (M= 2.93) and "Knowledge of

healthcare ethics and medico-legal issues" (M= 2.27) received the highest and lowest scores, respectively.

Table 3 shows the participants' perceived skill level in the "Health sciences reference and information services" category. The total average score of the participants' skill level in this category was 3.19, which was a little higher than average and therefore relatively and satisfactory. Among the skills related to this category, the average scores for skills "Knowledge of scientometrics basics and ability to use scientometrics tools" (M=2.77), "Expertise in evidence-based medical information searching (identifying and retrieving latest medical evidence)" (M=2.99) and "Understanding, evaluating and formulating clinical questions" (M=2.95) were relatively low, however, the average scores of the other skills were relatively high.

Another set of discipline specific skills that was evaluated were skills related to "management of health information resources". As shown in Table 4, the total average score of the participants' skill level in this category was 3.47, which was a little higher than average and therefore relatively satisfactory. The highest average score was related to "Ability to operate the process of circulation (registration, issue, return, reservation, overdue notices and fine management)" at 4.17. "Knowledge of indexing web-based information" with an average of 2.84 obtained the least average.

In the "information systems and technologies" category, the participants' perceived skill level was low (M=2.87) and unsatisfactory. The skill "Knowledge of Integrated Library Automation Systems", being one of the routine activities of the librarians, received the highest average of 4.22. In contrast, "portal/webpage design and maintenance skills" with an average of 2.20 received the lowest score.

"User training" was another set of discipline specific skills which were evaluated. The total average score (M= 2.80) as well as the average score of all skills related to this category were low and unsatisfactory (Table 6).

In addition, in the "research methods" category, the total average score of the participants' skill level was 2.69, which was relatively low. All skills related to this category also had a relatively low average score (Table 7).

Regarding the evaluation of general skill level, as Table 8 indicates the average score of the participants' perceived level in general skill was 3.03, which is relatively satisfactory.

The highest average score was related to “Team working” (M= 3.56) and the lowest average score was related to “information economic” (M= 2.55).

One-way ANOVA statistical analyses were carried out to compare the overall average score of discipline specific and general skills of librarians participating in the study, considering demographic features. The results revealed that there are significant differences in perceived level of discipline skills among the groups for level of education, age, degree, and work experience. The perceived level of general skills for librarians with a master’s degree was higher than those with a diploma (p-value=0.007) or bachelor’s degree (p-value=0.041). The perceived level of discipline specific skills for librarians with a master’s level and above was also higher than those with a diploma (p-value<0.001) or bachelor’s degree (p-value=0.047). In addition, the perceived level of discipline specific skills in librarians with 11 to 15 years of work experience was significantly higher than those with over 20 years work experience (p-value=0.025). Also, the p-value for librarians with work experience between 16 and 20 years was 0.048. Furthermore, the results of analyses showed that the perceived level of general skills in librarians between 36 to 45 years of age was higher than the 46-55 age group (p-value=0.026). The perceived level of discipline specific skills in the 26-35 age group was significantly higher than those between 46-55 of age (p-value=0.017). The perceived level of general skills and the perceived level of discipline specific skills in librarians with a degree other than librarianship was significantly lower than those with a degree in medical librarianship (p-value<0.001) as well as general librarianship (p-value=0.002).

Discussion

The results of the study indicated that the perceived level of discipline specific skills in librarians working at Iran, Tehran and Shahid-Beheshti universities of medical sciences were not satisfactory in all six categories of skills.

As the results showed, the participants’ perceived skill level in the “health sciences environment” category was relatively low (M=2.55), while acquiring skills related to this category are considered to be very important for health librarians. In a study in Pakistan, Ullah and Anwar acknowledged that senior librarians and managers consider skills related to “health sciences environment” significant. In particular, according to their

study, “understanding of medical terminologies and concepts” is very important for providing effective services to users. As medical librarians work with medical resources and information and provide information services to healthcare professionals, having an understanding of the health science environment is very helpful to them (Ullah & Anwar, 2013). Among the skills related to “health sciences environment”, only “understanding of medical terminologies and concepts” was obtained a slightly high average score (M=2.93) by the present study participants. This was because medical terminology is included in the curriculum of health librarianship. Nevertheless, the participants’ skill level in this regard was still not desirable and shows that the current university courses have not been able to help in achieving overall educational goals. This weakness in skills can be improved by updating the curriculum, changes in teaching methods, and holding workshops in libraries.

In the “Health sciences reference and information services” category, the higher average score was related to the “Expertise in information retrieval and search strategy techniques”. Tahouri and Fattahi have listed the “discipline specific and general duties” that head of departments in central libraries of universities should undertake. They also provided a list of knowledge, skills and capabilities expected of them, which have been prioritized based on their own agreement. Based on this study, “information retrieval skills on the web” with an average score of 4.43 was found to be the sixth priority (Tahouri & Fattahi, 2005). Similarly, the results of the current study showed that the skill level of librarians working in university libraries of Iran, Tehran and Shahid Beheshti universities of medical sciences in “Expertise in information retrieval and search strategy techniques” was relatively satisfactory (M= 3.52). Conducting appropriate educational programs and workshops would help librarians more to enhance their information retrieval skills and hence it will result in higher user satisfaction.

In another study, Mansourian pointed to the importance of the presence of clinical research librarians to provide the necessary information and resources for clinical research. According to this study, this is one of the new positions and will create new job opportunities for medical librarians (Mansourian, 2011). However, the present study showed that the participants’ skill level in “Understanding, evaluating and formulating clinical questions” was relatively low and unsatisfactory (M= 2.95). Therefore, medical

librarianship departments should put more efforts to include related courses in the curriculum, including theoretical aspects as well as arranging internships for LIS students to participate in clinical rounds to further develop their competencies and skills. Defining new subfields like clinical librarianship at master or PhD levels would also provide new job opportunities for librarians to work in clinical environments. Being active in health care teams would help librarians to more effectively carry out their roles.

In the "management of health information resources" category, results of the current study showed that the participants' perceived skill level in "Ability to operate the process of circulation (registration, issue, return, reservation, overdue notices and fine management)", being among the routine activities of librarians, was high (M=4.17) and satisfactory. In addition, the participants' perceived skill level in both "Knowledge and application of National Library of Medicine (NLM) classification scheme" and "Knowledge and application of the National Library of Medicine system of Medical Subject Headings (MeSH)" was relatively satisfactory (M=3.65). This relative satisfactory score is probably due to the use of NLM classification in Iranian medical university libraries and the experience of librarians working in these libraries using these classification schemes and subject headings. In addition, the NLM classification and MeSH thesaurus are already taught in medial librarianship programs, which can be another factor why the participants' skill level in this area was satisfactory. Contrary to the results of this study, Ullah and Anwar's study reported that Pakistan librarians' skill level in these two skills were low, which is due to the use of LOC and DDC subject headings in Pakistan libraries (Ullah & Anwar, 2013).

In the "user training" category, results of the current study showed that while the participants' perceived skill level in "Knowledge of information literacy standards" obtained the highest average score (M=2.95) among others skills related to this category, it was still relatively unsatisfactory. However, information literacy has been recognized as one of the required skills for LIS professionals. For example, in a research carried out by Nonthacumjane, information literacy is considered as one of the necessary skills for LIS professionals (Nonthacumjane, 2011). Findings of a research by Raju also revealed that information literacy is one of the required skills mentioned in some job

advertisements and interviews for recruiting LIS professionals in Southern African university libraries (Raju, 2014).

In the "research methods" category, the study findings indicated that the participants' perceived skill level in this regard was relatively low (M=2.67). The importance of acquiring research method skills for LIS professionals has been acknowledged in the literature. For example, findings of a study by Lewis et al. reported that 43 percent of librarians and 49 percent of library managers stated that they needed knowledge and skills in research methods. According to this study, the need for these skills would even increase in the future as stated by 60 percent of librarians and 51 percent of library managers. (Lewis et al., 2011) Librarians are increasingly becoming research partners and authors of scientific papers and reports. They are no longer just information searchers. They are becoming members of research teams. (Lewis et al., 2011) In the study by Ullah and Anwar, "Ability to use research tools such as questionnaires, focus groups and interviews to conduct user studies" were considered as important for medical librarians, with an average of 3.64 by senior librarians and 3.30 by chairmen of library committees (Ullah & Anwar, 2013). However, in the present study, the participants rated their skill level of "using research tools" as relatively low (M= 2.87). Also, in a Ullah and Anwar's study, "knowledge and application of data analysis software (SPSS, Instate, etc.)" were considered as important for medical librarians, with an average of 3.25 and 3.24 by senior librarians and chairmen of library committees, respectively (Ullah & Anwar, 2013). However, in the present study, the respondents rated their skill level of "using data analysis software" as relatively low, (M=2.51).

Based on the findings of this study, the participants' general skill level with an average of 3.03 was relatively high. In the study by Nonthacumjane, teamwork is mentioned as one of the important general skills for librarians (Nonthacumjane, 2011). A study by Raju also found that teamwork has been mentioned to a great extent in job ads and interviews as one of the important skills necessary for librarians (Raju, 2014). The findings of the study by Gerolimos also showed that teamwork, repeated 38 percent in LIS job ads, was identified as one of the necessary skills for librarians (Gerolimos & Konsta, 2008). In another study, Parirokh and Ilkhani also stated that communication and cooperation skills are among important skills for librarians (Parirokh & Ilkhani, 2014). The findings of the

current study also revealed that the participants' skill level in "teamwork" was relatively high, with an average score of 3.56. It received the highest average score compared to the other general skills.

The analysis of the results also found a significant relationship between the participants' skill level in both discipline specific and general skills with variables such as level of education, age, and degree ($p<0.05$). The findings indicated that the participants' skill level in both discipline specific and general skills was greater in those with the master or PhD degree than those with the bachelor or diploma degrees. This is in line with the study by Barati et al. which showed that there is a significant relationship between communication skills (as one of the general skill) and the student's level of education, the higher the level of education, the higher the communication skill level. (Barati, Moeini, Samavati, & Salehi, 2012) Based on the findings of this research, it seems that taking more related courses and being in contact with the university and faculty members can essentially improve the discipline specific and general skills of individuals.

No significant relationship between work experience and the level of general skills was found in the current study. However, the relationship between the participants' skill level in discipline specific and their work experience was significant ($p<0.05$). The level of the discipline specific skills was significantly higher in librarians with work experience of 11- 15 years than those with above 20 years work experience. It can be inferred that librarians with less work experience are young, have higher capabilities in learning technical and new skills, have high motivation for learning, put more effort to obtain job promotions, and therefore have higher discipline specific skill level compared to senior librarians.

In contrast, the average score for general skills was higher in librarians with 36- 45 years of age. Based on the findings of this research, it seems that librarians with 36- 45 years of age have higher general skills compared to younger librarians, due to their substantial work experience. These results are in contrary to Sabzevari et al. (Sabzevari, Soltani Arabshahi, Shekarabi, & Koohpayehzadeh, 2006) and Barati et al. (Barati, Moini, Afsar, & Ahmad Panah, 2012). Barati et al. showed that with an increase in age, the level of communication skills (as one of general skills) decreased (Barati, Moini, et al., 2012). Sabzevari et al. (20) also found that there is significant relationship between the age and

communication skills of nursing students. The level of communication skills was higher in younger students. (Sabzevari et al., 2006) According to the findings of the present study, it can be stated that younger librarians have higher capabilities in learning new skills and also due to fact that they were recently graduated from university they were still fresh and therefore they obtained higher scores in discipline specific skills. In addition, with an increase in age, burnout and lack of motivation increases, which can have an influence on the individual's discipline specific skills.

The average score of discipline specific and general skills among medical librarians were significantly higher than those with general LIS or non-related degrees. These results are similar to the study by Barati et al. in which they found that the level of communication skills had a significant correlation with the individuals' field of study. The level of communication skills was higher in fields that had related courses in their curriculum. (Barati, Moeini, et al., 2012) Findings of the present study also indicated that having a related university degree improves individual's discipline specific and general skills.

In conclusion, considering the main users of medical libraries, medical students, specialists and practitioners, training professional and skilled medical librarians will be achieved only when LIS faculties provide up-to-date and high quality educational programs to improve librarians' both discipline specific and general skills. Such librarians will be able to meet users' actual and potential information needs in the medical community in the areas of education, research and clinical practice using new approaches and technologies. That is, in the 21st century a new generation of skilled and up-to-date medical librarians are needed who are familiar with the latest changes in medical library and information science and are able to identify the information needs of producers and consumers of medical information.

The results of this study indicated that, the perceived skill level of librarians working at libraries of Iran, Tehran and Shahid-Beheshti universities of medical sciences in general skills was relatively satisfactory but in discipline specific was relatively unsatisfactory. This shows that LIS educational programs have not been able to create a balance between theoretical training and practical skills required for the job market. Thus, medical librarianship departments should continuously evaluate and revise the LIS curriculum considering the necessary skills for librarians at workplace. In addition, using the

curriculum of successful countries can also be effective in revising the course content and making use of new and effective educational methods. Skills introduced in this study can also be used in developing or revising the medical librarianship curriculum.

Conducting qualitative studies to identify further necessary skills for medical librarians, investigating how to improve librarians' skills at workplace, and assessing skill level of medical librarians working at other medical university or hospital libraries are recommended for future studies.

Conflict of interest

The authors declare no conflict of interests.

Tables

Variable		Frequency	Percent
Gender	Female	98	91.6
	Male	9	8.4
Level of Education	Diploma	14	13.3
	Associate degree	7	6.7
	Bachelor	36	34.3
	MA	44	41.9
	P.H.D	4	3.8
work experience	Under 5	7	6.7
	6-10	16	15.2
	11-15	18	17.1
	16-20	28	26.7
	More than 20	36	34.3
Degree of education	Librarianship	33	31.1
	Medical librarian	35	33
	Non-Librarianship	38	35.8
Age	Under 25	0	0
	26-35	22	21
	36-45	48	45.7
	46-55	30	28.6
	More than 55	5	4.8

Table 1: Demographic characteristics of respondents

S. no	Skill	Frequency (Valid Percent)					Mean	SD
		Very low	Low	Average	High	Very high		
1	Knowledge of different branches and specialities of health sciences	13 (12.3)	35 (33)	41 (38.7)	14 (13.2)	3 (2.8)	2.61	0.96
2	Knowledge of education and training patterns of health-related professions	17 (16.2)	37 (35.2)	39 (37.1)	10 (9.5)	2 (1.9)	2.45	0.94
3	Knowledge of objectives of medical education at undergraduate as well as postgraduate level	20 (19.2)	33 (31.7)	29 (27.9)	19 (18.3)	3 (2.9)	2.53	1.08
4	Understanding of medical terminologies and concepts	9 (8.7)	26 (25)	39 (37.5)	23 (22.1)	7 (6.7)	2.93	1.04
5	Understanding of the institution's information policies	20 (19.2)	30 (28.8)	31 (29.8)	19 (18.3)	4 (3.8)	2.58	1.11
6	Knowledge of healthcare ethics and medico-legal issues	26 (25.2)	37 (35.9)	28 (27.2)	10 (9.7)	2 (1.9)	2.27	1.01
7	Knowledge of accreditation standards that affect medical libraries	19 (17.9)	31 (29.2)	36 (34)	18 (17)	2 (1.9)	2.55	1.03
8	Knowledge of health sciences scholarly communication patterns and information infrastructure	28 (26.7)	26 (24.8)	35 (33.3)	15 (14.3)	1 (1)	2.38	1.05
9	Introduction to general medicine	12 (11.7)	37 (35.9)	30 (29.1)	19 (18.4)	5 (4.9)	2.68	1.05
11	Total						2.55	0.84

Table 2: Frequency distribution and standard deviation of discipline-specific skills in the field of health sciences in 2016

S. no	Skill	Frequency (Valid Percent)					Mean	SD
		Very low	Low	Average	High	Very high		
1	Understanding of information-seeking behaviour and needs of users	6 (5.8)	14 (13.6)	36 (35)	32 (31.1)	15 (14.6)	3.34	1.07
2	Knowledge of print reference resources in health sciences	8 (7.7)	23 (22.1)	32 (30.8)	28 (26.9)	13 (12.5)	3.14	1.13
3	Knowledge of electronic reference resources in health sciences	4 (3.8)	29 (27.9)	30 (28.8)	28 (26.9)	13 (12.5)	3.16	1.08
4	Knowledge of scientometric basics and ability to use scientometric tools	17 (16.7)	26 (25.5)	31 (30.4)	19 (18.6)	9 (8.8)	2.77	1.19
5	Ability to use medical bibliographic databases	6 (5.8)	12 (11.7)	31 (30.1)	33 (32)	21 (20.4)	3.49	1.11
6	Expertise in information retrieval and search strategy techniques	5 (4.9)	14 (13.6)	29 (28.2)	32 (31.1)	23 (22.3)	3.52	1.12
7	Expertise in evidence-based medical information searching (identifying and retrieving latest medical evidence)	9 (8.6)	31 (29.5)	27 (25.7)	28 (26.7)	10 (9.5)	2.99	1.13
8	Resource sharing and coordination with other libraries	14 (13.6)	17 (16.5)	30 (29.1)	30 (29.1)	12 (11.7)	3.08	1.21
9	Information manipulation and repackaging (finding, evaluating, selecting and rewriting information for immediate use by the client)	8 (7.8)	21 (20.6)	27 (26.5)	31 (30.4)	15 (14.7)	3.23	1.17
10	Ability to conduct reference interviews and select the appropriate resource to match the users' needs	3 (2.9)	16 (15.5)	27 (26.2)	41 (39.8)	16 (15.5)	3.49	1.02
11	Understanding, evaluating and formulating clinical questions	9 (8.9)	31 (30.7)	27 (26.7)	24 (23.8)	10 (9.9)	2.95	1.14
12	Total						3.19	0.86

Table 3: Frequency distribution and standard deviation of discipline-specific skills in the field of Health sciences reference and information services in 2016

S. no	Skill	Frequency (Valid Percent)					Mean	SD
		Very low	Low	Average	High	Very high		
1	Knowledge of bibliographic tools, selection aids and acquisition of materials	6 (5.7)	16 (15.1)	32 (30.2)	30 (28.3)	22 (20.8)	3.43	1.14
2	Knowledge and application of National Library of Medicine (NLM) classification scheme	6 (5.8)	12 (11.5)	26 (25)	28 (26.9)	32 (30.8)	3.65	1.19
3	Knowledge and application of the National Library of Medicine system of Medical Subject Headings (MeSH)	6 (5.7)	13 (12.4)	25 (23.8)	28 (26.7)	33 (31.4)	3.65	1.20
4	Knowledge and application of cataloguing rules, standards for bibliographic formats, data conversion and copy cataloguing	4 (3.8)	16 (15.4)	32 (30.8)	27 (26)	25 (24)	3.50	1.13
5	Capability of indexing and abstracting of medicine documents	11 (10.5)	25 (23.8)	27 (25.7)	29 (27.6)	13 (12.4)	3.07	1.19
6	Knowledge of indexing web-based information	13 (12.5)	26 (25)	37 (35.6)	20 (19.2)	8 (7.7)	2.84	1.11
7	Knowledge of serials management and operation (ordering, claiming, invoicing, renewal, holdings reports, binding, etc)	10 (9.7)	20 (19.4)	30 (29.1)	24 (23.3)	19 (18.4)	3.21	1.23
8	Knowledge of resource maintenance, safety, conservation and preservation techniques	8 (7.7)	15 (14.4)	37 (35.6)	26 (25)	18 (17.3)	3.29	1.14
9	Knowledge of weeding practice (discarding and writing off unusable and obsolete materials) and its importance	3 (2.9)	10 (9.5)	22 (21)	34 (32.4)	36 (34.3)	3.85	1.08
10	Ability to operate the process of circulation (registration, issue, return, reservation, overdue notices and fine management)	2 (1.9)	6 (5.8)	16 (15.4)	28 (26.9)	52 (50)	4.17	1.01
11	Knowledge of copyright, licensing, privacy and intellectual property rights issues/laws	5 (4.8)	14 (13.3)	25 (23.8)	39 (37.1)	22 (21)	3.56	1.10
12	Total						3.47	0.82

Table 4: Frequency distribution and standard deviation of discipline-specific skills in the field of Management of health information resources in 2016

S. no	Skill	Frequency (Valid Percent)					Mean	SD
		Very low	Low	Average	High	Very high		
1	Some knowledge of telecommunication and net working	4 (4)	19 (19.2)	41 (41.4)	22 (22.2)	13 (13.1)	3.21	1.03
2	Knowledge and understanding of Internet for library use (e-mail, discussion groups, search engines, web resources, methods of information delivery)	4 (3.8)	13 (12.5)	27 (26)	36 (34.6)	24 (23.1)	3.60	1.09
3	Knowledge of programming languages and standards for data transfer and exchange (HTML, C, VB, XML, etc.)	17 (16.5)	27 (26.2)	43 (41.7)	11 (10.7)	5 (4.9)	2.61	1.04
4	Knowledge and application of Web 2.0 technology in libraries (Library 2.0)	12 (11.8)	19 (18.6)	42 (41.2)	21 (20.6)	8 (7.8)	2.94	1.08
5	Understanding of digitisation technology and management programs to create digital resources	8 (8)	23 (23)	36 (36)	21 (21)	12 (12)	3.06	1.11
6	Knowledge of Integrated Library Automation Systems	2 (1.9)	4 (3.8)	15 (14.2)	32 (30.2)	53 (50)	4.22	0.95
7	Using MS Office (MS Word, MS Excel, MS Power point) and Inpage (an Urdu word processor)	3 (2.9)	6 (5.8)	22 (21.2)	30 (28.8)	43 (41.3)	4	1.06
8	Basic knowledge of and ability to use expert systems (software which find information like a human expert in the field to solve problems)	21 (20.8)	30 (29.7)	26 (25.7)	20 (19.8)	4 (4)	2.56	1.14
9	Web page/portal designing and maintenance skills	37 (35.9)	25 (24.3)	29 (28.2)	7 (6.8)	5 (4.9)	2.20	1.14
10	Basic knowledge of database management	31 (29.8)	27 (26)	32 (30.8)	9 (8.7)	5 (4.8)	2.32	1.13
11	Ability to use mobile applications in medical fields	34 (32.4)	21 (20)	34 (32.4)	8 (7.6)	8 (7.6)	2.38	1.22
12	Knowledge of electronic publishing and its tools (Adobe Digital Editions, Adobe Acrobat Reader, Calibre, etc.)	27 (26.5)	22 (21.6)	37 (36.3)	9 (8.8)	7 (6.9)	2.48	1.17
13	Creating digital content (production and distribution of text files, electronic publications, animation, photos, videos and audio)	29 (28.4)	16 (15.7)	36 (35.3)	11 (10.8)	10 (9.8)	2.57	1.27
14	Knowledge of webometrics	34 (32.7)	23 (22.1)	29 (27.9)	12 (11.5)	6 (5.8)	2.35	1.21
15	Ability to improve presentation by employing audio-visual tools and handouts	17 (16)	34 (32.1)	29 (27.4)	14 (13.2)	12 (11.3)	2.71	1.21
	Total						2.87	0.80

Table 5: Frequency distribution and standard deviation of discipline-specific skills in the field of Information systems and technologies in 2016

S. no	Skill	Frequency (Valid Percent)					Mean	SD
		Very low	Low	Average	High	Very high		
1	Knowledge of information literacy standards	9 (8.7)	25 (24)	39 (37.5)	24 (23.1)	7 (6.7)	2.95	1.04
2	Knowledge of instructional methodologies and teaching techniques	13 (12/5)	24 (23/1)	35 (33/7)	22 (21/2)	10 (9/6)	2.92	1.15
3	Ability to develop and deliver information literacy programs and products (such as lectures, tutorials, brochures, pathfinders, subject guides, etc.)	20 (19.4)	20 (19.4)	33 (32)	21 (20.4)	9 (8.7)	2.79	1.22
4	Ability to select appropriate delivery methods for information literacy programs	23 (22.3)	21 (20.4)	39 (37.9)	13 (12.6)	7 (6.8)	2.61	1.16
5	Ability to make presentations to user groups, visitors, etc	15 (14.4)	29 (27.9)	33 (31.7)	20 (19.2)	7 (6.7)	2.75	1.12
	Total						2.80	1.02

Table 6: Frequency distribution and standard deviation of discipline-specific skills in the field of user education

S. no	Skill	Frequency (Valid Percent)					Mean	SD
		Very low	Low	Average	High	Very high		
1	Basic understanding of research methodologies (both quantitative and qualitative)	14 (13.5)	28 (26.9)	37 (35.6)	37 (35.6)	3 (2.9)	2.73	1.03
2	Basic knowledge of descriptive and inferential statistics	20 (19)	28 (26.7)	35 (33.3)	35 (33.3)	2 (1.9)	2.58	1.06
3	Ability to use research tools such as questionnaires, focus groups and interviews to conduct user's studies	12 (11.9)	24 (23.8)	36 (35.6)	36 (35.6)	6 (5.9)	2.87	1.08
4	Knowledge and application of data analysis software (SPSS, Instate etc)	22 (21.2)	31 (29.8)	29 (27.9)	29 (27.9)	3 (2.9)	2.51	1.10
5	Knowledge and application of citation styles and reference managers (endnote, Procite, etc)	18 (17.5)	31 (30.1)	25 (24.3)	25 (24.3)	11 (10.7)	2.73	1.24
6	Ability to write research reports	21 (20.2)	25 (24)	28 (26.9)	28 (26.9)	10 (9.6)	2.74	1.25
7	Total						2.67	0.97

Table 7: Frequency distribution and standard deviation of discipline-specific skills in the field of research methods

S. no	Skill	Frequency (Valid Percent)					Mean	SD
		Very low	Low	Average	High	Very high		
1	General managerial and supervisory	14 (13.6)	18 (17.5)	37 (35.9)	23 (22.3)	11 (10.7)	2.96	1.20
2	Planning and goal setting	14 (13.6)	25 (24.3)	26 (25.2)	32 (31.1)	6 (5.8)	2.91	1.15
3	Project Management	16 (15.5)	28 (27.2)	28 (27.2)	27 (26.2)	4 (3.9)	2.75	1.12
4	Ability to make decisions	7 (6.8)	29 (28.2)	27 (26.2)	34 (33)	6 (5.8)	3.02	1.06
5	Capability of analytical skills and problem-solving	12 (11.8)	21 (20.6)	31 (30.4)	32 (31.4)	6 (5.9)	2.99	1.11
6	Ability to prepare and manage budget and raise funds from external sources	15 (14.4)	16 (15.4)	45 (43.3)	22 (21.2)	6 (5.8)	2.88	1.08
7	Interpersonal and public relations skills	8 (7.8)	17 (16.5)	33 (32)	32 (31.1)	13 (12.6)	3.24	1.11
8	Negotiating skills for contracts/agreements	8 (7.7)	18 (17.3)	33 (31.7)	28 (26.9)	17 (16.3)	3.26	1.15
9	Marketing of library services and resources	6 (5.9)	17 (16.7)	39 (38.2)	27 (26.5)	13 (12.7)	3.23	1.06
10	Ability to evaluate library performance qualitatively and quantitatively	12 (11.9)	18 (17.8)	28 (27.7)	32 (31.7)	11 (10.9)	3.11	1.18
11	Personnel management and staff development (recruit, train, supervise and evaluate staff)	10 (9.7)	27 (26.2)	35 (34)	26 (25.2)	5 (4.9)	2.89	1.04
12	Communicating effectively in oral, written and electronic form	7 (6.9)	21 (20.6)	30 (29.4)	30 (29.4)	14 (13.7)	3.22	1.13
13	Team working	6 (5.9)	12 (11.9)	25 (24.8)	35 (34.7)	23 (22.8)	3.56	1.14
14	knowledge management	16 (15.5)	13 (12.6)	39 (37.9)	27 (26.2)	8 (7.8)	2.98	1.15
15	Information economy	28 (27.2)	15 (14.6)	38 (36.9)	19 (18.4)	3 (2.9)	2.55	1.16
	Total						3.03	0.89

Table 8: Frequency distribution and standard deviation of discipline-specific skills in the field of general skills

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